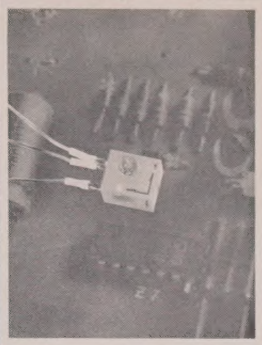
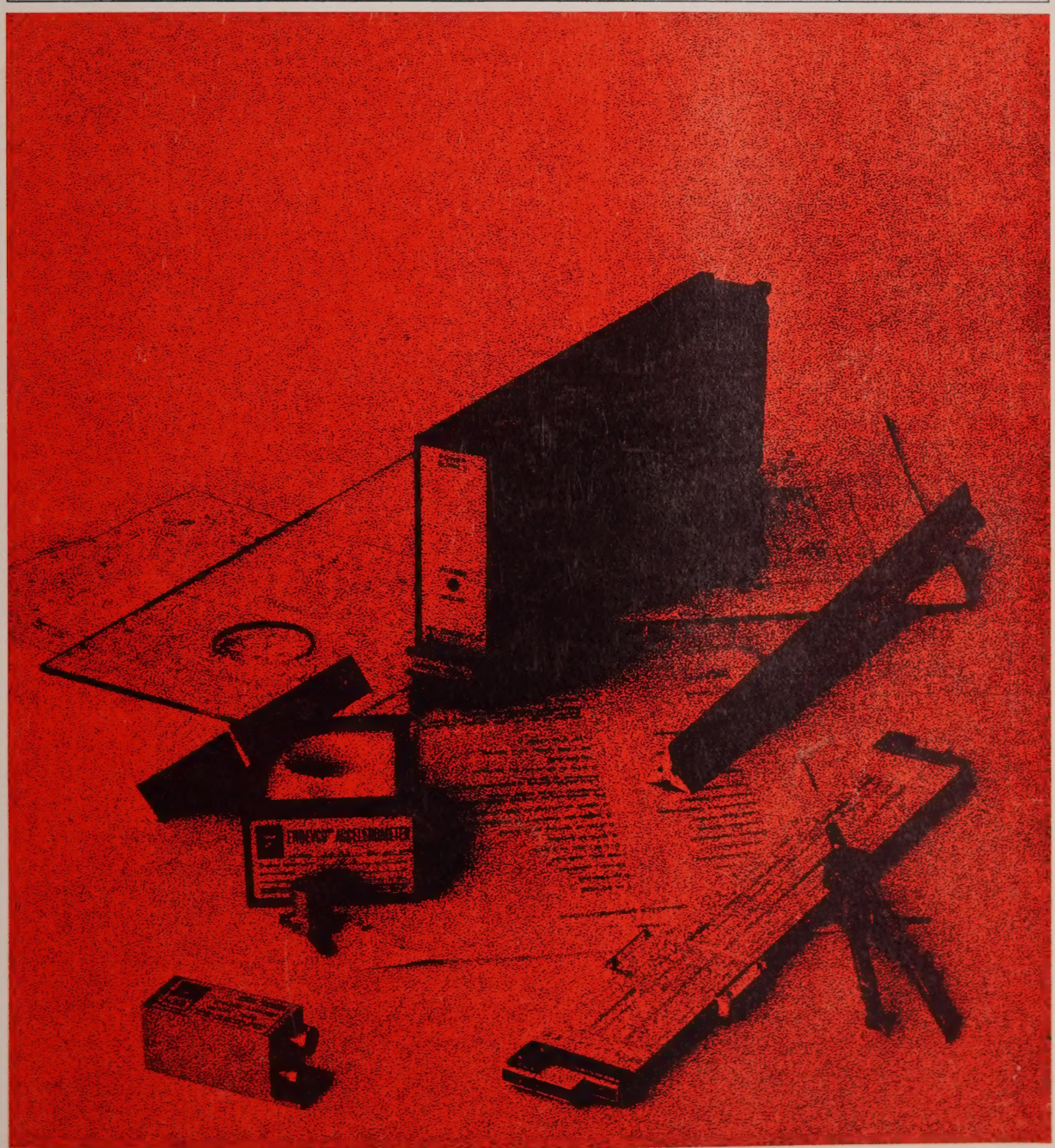
ENDEVCO

INSTRUCTION MANUAL

FOR MODEL 2954A
PEAK HOLDING METER





INSTRUCTION MANUAL

FOR MODEL 2954A
PEAK HOLDING METER

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ENDEVCO, Dynamic Instrument Division,
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ENDEVCO PRODUCT DATA

MODEL 2954A

PEAK HOLDING METER

General Description

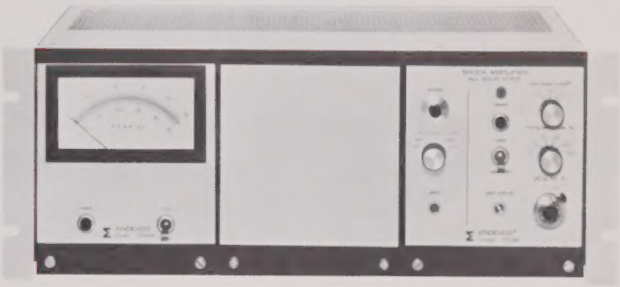
The ENDEVCO® Model 2954A is a peak-holding meter assembly which detects, stores, and displays the maximum amplitude of a transient or recurring signal. It is specifically designed to operate with the Model 2718A Shock Amplifier to respond to the signal from a piezoelectric shock or vibration sensing transducer. Although particularly suited for measuring the peak amplitude of shock pulses, it can be used to display the peak amplitude of sine or random vibration data.

The Model 2954A Peak-Holding Meter assembly, used in conjunction with its companion amplifier, the Model 2718A, measures the peak amplitudes faster, easier, and more accurately than with conventional oscilloscopes. The latter devices normally require careful adjustment of calibration and triggering levels. When oscilloscopes are used with photographic devices, they also require additional time for setting of correct exposures and the development of the photographic papers.

Shock machines are usually adjusted to produce a specific pulse amplitude. The instantaneous indication of the 2718A/2954A System permits the operator to quickly determine whether or not the desired pulse amplitude has been achieved, without the necessity of improvising synchronization devices to ensure the reliable acquisition of data.

The peak-holding circuit senses the peak value of the input pulse and presents the information on a precision indicating meter. The meter has two scales calibrated to correspond exactly to the full scale ranges on the Model 2718A Amplifier. It will hold the indicated reading within 2% for at least one minute when the ambient temperature is 70° F. The meter reading is reset by means of a push button switch.

The modularized configuration of the Model 2954A permits convenient and rapid installation and/or interchangeability of the Peak-Holding Meter assembly into the Model 4992A Rack of the Model 2992 Portable Carrying Case. The external interconnecting cable, Model 15438, carries power and signal between the Peak-Holding Meter and the Shock Amplifier.



Model 2954A mounted in a Model 4992A Rack Enclosure together with a Model 2718A Shock Amplifier and a 14718 Blank Panel.

Models 2954A and 2718A mounted in a Model 2992 Dual Portable Case.

Specifications for Model 2954A

(Operated with the Model 2718A Shock Amplifier)

ELECTRICAL

Accuracy (Referred to the output of the Shock Amplifier)	Less than ±2% error for half sine pulses of one millisecond or greater duration. Less than ±3% error for half sine pulses of duration 100 microseconds to 1 millisecond. Less than ±5% error for half sine pulses of duration 50 microseconds to 100 microseconds.
Amplitude Linearity	±1% of full scale.
Ranges	Two scales calibrated in peak g.
Display Time	Less than −2% error per minute over the temperature range of +40°F to +72°F, doubling for each 18°F above 72°F.
Zero Drift	±2% or less of full scale over a 24 hour period. (In addition to drift of the charge amplifier.) ±2% or less of full scale over temperature range of +40°F to +125°F.
Power	+30V and −30VDC (obtained from Model 2718A via Interconnect Cable).
Recommended Configuration	The Model 2954A has been specifically designed for use with the Model 2718A in a rack or portable configuration.

PHYSICAL

Dimensions	5.7″ wide x 6.5″ high x 9⅝″ deep exclusive of connectors.
Weight	2¼ lbs.
Finish	Gray Enamel.
Mounting	Mounts in Model 4992A Rack or Model 2992 Case.
Connector	Cannon WK-5-32S, mates with plug on Model 15438 Interconnect Cable Assembly.

PHYSICAL continued

Controls	
Reset	Push button switch to reset meter.
Positive-Negative	Two-position switch which selects the input pulse polarity to which the meter will respond.

ENVIRONMENTAL

Temperature	
Operating	+40°F to +125°F.
Non-Operating	−65°F to +185°F.
Humidity	95% R.H.

Continued product improvement necessitates that Endevco reserve the right to modify these specifications and/or prices without notice.

RELIABILITY: Endevco maintains a program of constant surveillance over all products to ensure a high level of reliability. This program includes attention to reliability factors during product design, the support of stringent Quality Control requirements, and compulsory corrective action procedures. These measures, together with conservative specifications, have made the name Endevco synonymous with reliability.

PRICES: F.O.B. Pasadena

Model 2954A Peak-Holding Meter	$225.00 each
RELATED PRODUCTS:	
Model 2718A Amplifier	$725.00 each
Model 4992A Rack	$135.00 each
Model 14718 Blank Panel	$ 15.00 each
Model 2992 Dual Portable Case	$175.00 each
Model 15438 Interconnecting Cable	$ 20.00 each

Prices of ENDEVCO® products to be exported or purchased with intent to export beyond the territorial limits of the United States are subject to special quotation.

ENDEVCO Subsidiary of Becton, Dickinson and Company B-D

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MODEL 2954A

INSTRUCTION MANUAL

1.0 INTRODUCTION

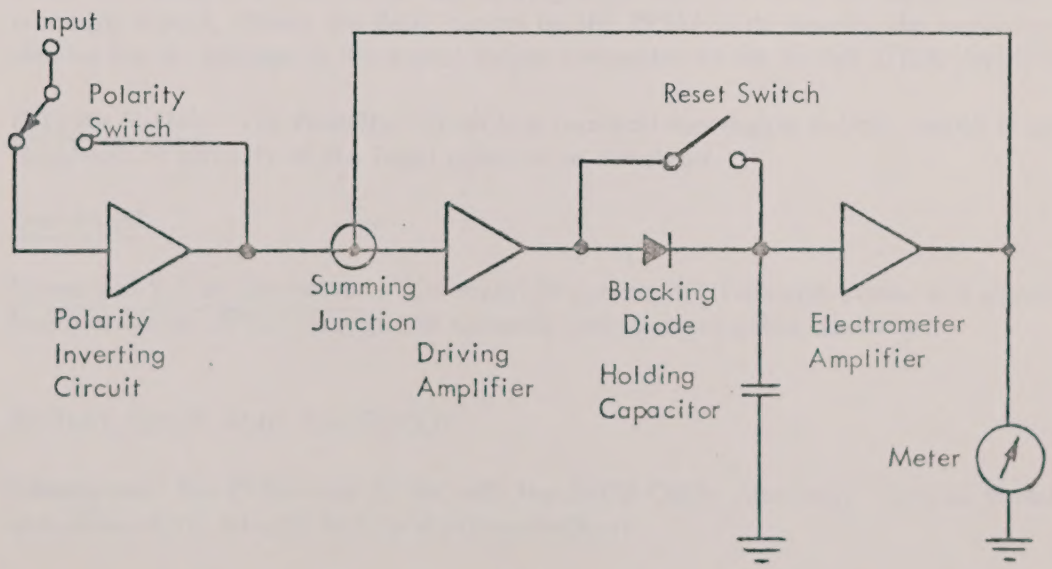
1.1 General Description

The Model 2954A Peak Holding Meter is used with the Model 2718A Shock Amplifier to indicate the maximum amplitude of a single pulse or a series of pulses from any piezoelectric transducer. The peak value is displayed for a limited time until it is either reset manually or until a peak of greater amplitude occurs.

The Model 2954A is mechanically and electrically compatible with the Model 2718A in either the rack-mounted or portable configuration. The 4-1/2" meter on the Model 2954A has two scales, 0 - 25 and 0 - 50, corresponding to the full scale ranges on the charge amplifier.

2.0 THEORY OF OPERATION

The peak holding meter circuit includes: (1) a polarity inverting circuit; (2) a summing junction; (3) a driving amplifier; (4) a holding capacitor and blocking diode; (5) an electrometer amplifer; and (6) an indicating meter.



BLOCK DIAGRAM MODEL 2954A

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2.0 THEORY OF OPERATION (continued)

2.1 Polarity

The Polarity Switch, together with the Polarity Inverting Circuit, is used to select the polarity of the pulse to be measured.

2.2 Summing Junction

The input pulse is compared to the electrometer amplifier output voltage at the summing junction. The error signal at the summing junction is amplified by the driving amplifier to charge the holding capacitor to the peak of the input pulse through the blocking diode.

2.3 Holding Circuit

After the peak of the input pulse has passed, the diode does not permit the capacitor to discharge. The potential across the capacitor is measured by the electrometer amplifier which drives the meter.

3.0 EXTERNAL CONTROLS AND CONNECTORS

3.1 Front Panel

3.1.1 Reset - The Reset Switch is a single pole push button switch connected across the blocking capacitor to discharge the holding capacitor; it clears the meter for any incoming signal. When the Reset button on the 2954A is depressed, the meter indicates the dc voltage at the signal output connector of the Model 2718A Amplifier.

3.1.2 Polarity Switch - The Polarity Switch is a two-position toggle switch, which is used to select the polarity of the input pulse to be measured.

3.2 Rear Panel

3.2.1 Power and Signal Connector - The multipin connector J1 accepts power and signal from the Model 2718A through the external interconnect cable assembly.

4.0 INITIAL SETUP AND CHECKOUT

Interconnect the 2954A and 2718A with the 15438 Cable Assembly. Turn on power and allow thirty minutes before starting checkout.

4.1 Model 2718A Shock Amplifier Checkout

To check out the Model 2718A and the Model 2954A as a system, first follow the initial setup and checkout procedure outlined in the Model 2718A Shock Amplifier Instruction Manual. When this has been accomplished, continue with the Model 2954A checkout.

4.2 Peak Holding Circuit

The meter will display the peak value of the highest output pulse or the peak value of the sinusoidal signal from the charge amplifier.

4.2.1 Zero - To adjust the meter to zero, first depress and release the Reset button on the 2718A, then depress and hold the 2954A Reset button. Turn the Zero adjust on 2718A for zero on the meter.

4.2.2 Full Scale - Apply a signal to the input of the 2718A. Follow the procedure outlined in the 2718A Initial Checkout. With the Low Frequency Cutoff Switch at 0.7 Hz, Calib-Operate switch at Operate, Full Scale g at 25 (black), and Sensitivity Dial at 1.0 (black), the 2954A Meter should read Full Scale for a 1000 Hz, 17.7 mV rms (25 mV pk) signal applied to the 2718A through the shielded, precision 1000 pF capacitor. This input signal will result in a 2718A output of 5.0 pk V.

4.2.3 Accuracy - The accuracy of the meter indication should be within ± 2% of the peak output of the charge amplifier for half-sine pulses of 1 msec or greater duration, or continuous signals. The over-all accuracy of the Model 2718A with the Model 2954A readout is better than ± 3.5% of full scale when the input is a 1000 Hz sinusoidal signal.

CAUTION: When the input signal is sinusoidal and/or continuous, depress and release the Reset Button on the 2954A before reading the meter to eliminate the effect of spurious peaks.

4.2.4 Calibration - With no signal applied to the 2718A, set the Calib-Operate switch to Calibrate. Depress and release the Reset button on the 2954A. The meter should read at one-half full scale, regardless of the position of the Full Scale range switch on the amplifier. Accuracy of the reading is ± 2-1/2 divisions (± 5% of full scale).

5.0 OPERATING INSTRUCTIONS

5.1 Mounting

The Model 2954A Peak Holding Meter can be mounted with the Model 2718A Shock Amplifier in either a rack or portable configuration. To mount the 2954A in the Model 4992A Rack, slide in the 2954A Module, tighten the two captive thumb screws on the front and then tighten the two Phillips screws on the rear skirt. The same procedure is followed for mounting the 2954A in the Model 2991A or 2992A Portable Carrying Cases.

5.2 Power

The Model 2954A is energized when the Model 2718A Shock Amplifier is turned on.

5.3 Zero Adjust

The Model 2954A is designed to be sensitive to and hold a transient input signal. Spurious, unwanted transients may appear at the input to the circuit from the following or other sources:

1. Turning amplifier on,
2. Changing ranges on the 2718A,
3. Operating the Calib-Operate switch,
4. Connecting or disconnecting a transducer.

Most transients will swing the meter to only a fraction of full scale and the meter is quickly reset by depressing the meter Reset button. Large transients may cause the circuits in the 2718A Amplifier to saturate, upsetting the dc output level of the amplifier. When the 2954A button is depressed and held, the meter indicates the dc level of the amplifier output.

When large transients are applied to the amplifier, the recovery time may be as long as 1-1/2 minutes, particularly if the Low Frequency Cutoff is set at 0.03 Hz. Alternately depress and release the Reset button on the amplifier then the Reset button on the meter, until the meter reading is stable.

To adjust the meter needle to zero, first press and release the amplifier Reset button, then press and hold the meter Reset button. With a small screwdriver turn the Zero potentiometer on the amplifier until the meter reads zero.

CAUTION: Before each measurement the meter zero should be checked by first depressing and releasing the amplifier Reset button, then the meter Reset button.

5.4 Polarity Switch

The Peak Holding Meter will display the peak value of the positive or the negative portion of the input pulse depending on the setting of the Polarity Switch. The meter zero should be checked whenever the Polarity Switch is operated.

5.5 Meter

The meter indicates full scale when a 5.0 volt peak signal is applied to the input of the Peak Holding Circuit.

6.0 CIRCUIT DESCRIPTION (See Drawing C-2954-501C)

The input signal for the Peak Holding Meter is taken from the Signal Output of the charge amplifier. Switch S1 is the polarity switch and applies the input signal to either the polarity reversing circuit or the summing junction. The polarity reversing circuit, consisting of Q1, Q2, and Q3, has a gain of one. The input signal and the electrometer output voltage are applied to the summing junction at the base of Q4. Transistors Q4, Q5, Q6, Q7 and Q8 make up the driving amplifier.

The holding capacitor, C3, is charged through the blocking diode, CR3. The peak voltage across the capacitor is sensed by electrometer tube, V1. Transistor Q9 regulates the screen and filament voltage of V1.

Transistors Q10, Q11, Q12 and Q13 form an electrometer amplifier and power amplifier to drive the meter.

Plus and minus 30 volt power is obtained from the charge amplifier.

7.0 MAINTENANCE AND TROUBLESHOOTING

7.1 Maintenance

See Model 2718A Instruction Manual for general information.

7.1.1 Peak Holding Meter - Before making any adjustments in the Peak Holding Meter, the plus and minus power supply voltages should be measured.

7.2 Troubleshooting

If the trouble is in the Peak Holding Meter, the dc voltages on the circuit board should be measured and compared with the voltages in Table I.

7.3 Calibration Procedure for Adjustment of Peak Holding Meter Model 2954A

The Model 2954A Peak Holding Meter is set at the factory before shipment to an indicated accuracy of ± 2% of full scale. Normally, this adjustment will remain stable within this range of accuracy and no readjustment is necessary. Only when careful and accurate measurements demonstrate that the indication on the meter is not within the specified accuracy, the following procedure is recommended for readjusting the meter. Use voltmeter, John Fluke 801B, or equal.

a. Connect the Model 2954A to the Model 2718A Charge Amplifier.
b. Turn on power and allow at least one hour for warmup.
c. Set the Full Scale switch on the 2718A to its highest position (5000 g black).

7.3 Continued

References. When a reference is made to components within the amplifier or meter circuit, the component designations will be followed by a number in parenthesis which refers to the following sections:

(1) Denotes Model 2718A Charge Amplifier
(2) Denotes Model 2954A Peak Holding Meter circuit

Identification of Components.

a. R46 (1) is the Zero Adjust potentiometer located on the lower left corner of the charge amplifier panel.

b. J3 (1) is the Signal Output connector for the charge amplifier. It is the BNC connector on the rear panel. The voltage on this connector is identical to the signal applied to the input of the Peak Holding Meter circuit.

c. R23 (2), R27 (2), and R37 (2) are located on the circuit board assembly behind the indicating meter. See Drawings C-12678-C and C-2954-501C.

d. S1 (2) is the polarity selection toggle switch on the meter.

e. S2 (2) is the push button Reset switch on the meter.

Reset Switch. Always depress and release the meter Reset switch, S2 (2), before reading the meter to discharge the holding capacitor.

7.3.1 Peak Meter Bias

Test Condition:	Full Scale	5000 Black
	S1 (2)	Positive

a. With R46 (1), adjust the voltage at J3 (1) to 0 ±10 mV dc.

b. Depress and hold the Reset switch, S2 (2). The voltage across resistor R23 (2) should be 500 ±10 mV dc. If the voltage is not within these limits, adjust R27 (2). Release the Reset switch.

7.3.2 Peak Meter Full Scale Adjust

a. With the polarity switch S1 (2) in "Positive" position, adjust zero potentiometer, R46 (1), until meter reads zero. Measure and record the voltage at J3 (1), which should be 0 ±50 mV dc (positive zero voltage).

7.3.2 Peak Meter Full Scale Adjust (continued)

b. Adjust R46 (1) until the voltage at J3 (1) is a change of -5.000 Vdc from "positive zero voltage."

c. Adjust R37 (2) until the meter reads exactly full scale.

d. With the polarity switch S1 (2) in "Negative" position, adjust R46 (1) until the meter reads zero. Measure and record the voltage at J3 (1) (negative zero voltage) which should be within 250 mV of the "positive zero voltage" recorded above.

e. Adjust R46 (1) until the voltage at J3 (1) is a change of +5.000 Vdc from the "negative zero voltage." Record the meter indication as a deviation from full scale which should be less than 2% of full scale.

f. Adjust R37 (2) until the deviation is cut in half.

g. Recheck the positive full scale reading by repeating Steps a and b.

NOTE: If it is not possible to obtain a 5.000 Vdc change in Steps b and e, use a magnitude of 4.000 Vdc change and change the words "full scale" in Steps c and e to "80% of full scale." The excellent linearity of the meter will permit the 80% point of the meter to be used as a reference without loss of accuracy.

8.0 FACTORY REPAIRS AND WARRANTY

Endevco Corporation warrants each new instrument to be free from defective material and workmanship for one year from date of sale to the original purchaser. A copy of the warranty is contained in the back of this manual.

If serious trouble occurs, the instrument should be carefully packed and returned to the factory for repair. Whenever possible, it should be accompanied by supplementary information, describing in particular the fault noted.

If upon examination it is found that the defect is not within the scope of this warranty, a statement of repair charges and a request for authorization to proceed will be submitted.

Address all shipments and correspondence to:

Endevco
801 South Arroyo Parkway
Pasadena, California 91109

TABLE I - TYPICAL DC OPERATING VOLTAGES

Conditions

Model 2954A Peak Holding Meter coupled to Model 2718A Charge Amplifier and zeroed.

Equipment

Simpson Meter Model 260 (or equivalent)

Q	BASE	EMITTER	COLLECTOR
1	0	-0.6 V	+9.6 V
2	0	-0.6 V	+8.2 V
3	+9.8 V	+9.8 V	+30 V
4	+1.5 V	+0.6 V	+0.8 V
5	0	+0.8 V	+15 V
6	+1.0 V	+0.8 V	+0.8 V
7	+0.8 V	+0.8 V	+30 V
8	-9 V	0	+30 V
9	+15 V	+15 V	+7.0 V
10	+15 V	+15 V	+30 V
11	+16 V	+15 V	+19 V
12	+15 V	+15 V	+0.5 V
13	-0.4 V	+0.3 V	-3.6 V

ELECTRICAL PARTS LIST

FOR

MODEL 2954 A

Des. No.	Part	Value and Description	Manufacturer and Part No.	Endevco Part No.
C1	Capacitor	220 pF, ±5%, 500 V, Silver Mica	Elmenco DM-15-221J	EC236
C2	Capacitor	.05 μF, ±20%, 50 V, Ceramic	Sprague 55C23A1	EC324
C3	Capacitor	.1 μF, ±5%, 100 V	Electro-Cube 411D1B104J	EC306
C4	Capacitor	20 pF, ±.5 pF, 300 V, Silver Mica	Elmenco DM-15	EC12
C5	Capacitor	.005 μF, ± 20%, 50 V, Ceramic	Sprague 40C172A5	EC239
CR1	Diode	Zener, 1N961	Motorola	ECR62
CR2	Diode	Zener, 1N961	Motorola	ECR62
CR3	Diode		Fairchild FD300	ECR113
J1	Receptacle		Cannon WK-5-32S	EJ251
	Mating Connector (right angle)		Cannon WK-5-23C	EP299
M1	Meter			12696
R1	Resistor	10.0 kΩ, ±1%, 1/2 W, Carbon	Dale DCS-1/2	ER160
R2	Resistor	20 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER671
R3	Resistor	15 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER168
R4	Resistor	15 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER168
R5	Resistor	5.1 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER763
R6	Resistor	10.2 kΩ, ±1%, 1/2 W, Carbon Depos.	Dalohm DCS-1/2	ER999
R7	Resistor	15 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER168
R8	Resistor	100 Ω, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER171
R9	Resistor	10 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER182
R10	Resistor	10 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER182
R11	Resistor	10 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER182
R12	Resistor	10 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER182

ELECTRICAL PARTS LIST (continued)

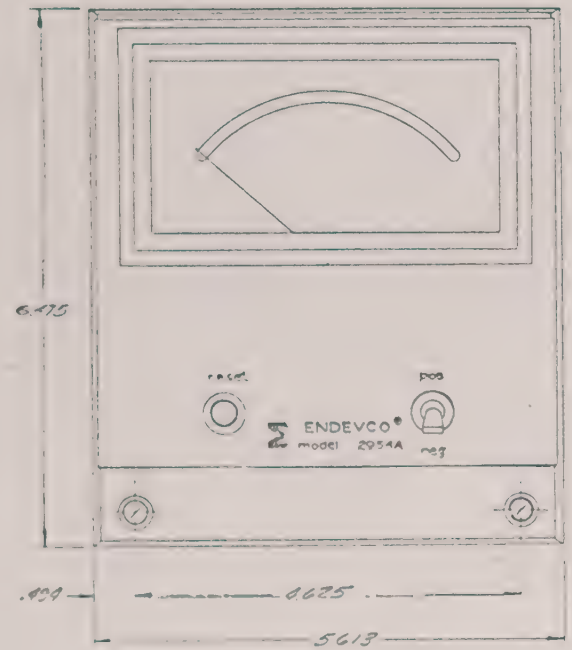
Des. No.	Part	Value and Description	Manufacturer and Part No.	Endevco Part No.
R13	Resistor	6.2 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER932
R14	Resistor	7.5 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER719
R15	Resistor	5.1 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER763
R16	Resistor	6.2 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER932
R17	Resistor	27 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER820
R18	Resistor	3 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER158
R19	Resistor	100 Ω, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER171
R20	Resistor	10 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER182
R21	Resistor	100 Ω, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER171
R22	Resistor	390 Ω, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER184
R23	Resistor	47 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER125
R24	Resistor	1.5 kΩ, ±1%, 1/4 W, WW	Riedon SM-7	ER1676
R25	Resistor	3 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER158
R26	Resistor	3 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER158
R27	Potentiometer	1 kΩ, ±10%, 3/4 W, Met. Film	Beckman 77P	ER1794
R28	Resistor	560 kΩ, ±10%, 1/2 W, Comp.	Allen Bradley Type EB	ER280
R29	Resistor	200 Ω, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER165
R30	Resistor	10 Ω, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER945
R31	Resistor	2.7 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER197
R32	Resistor	100 Ω, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER171
R33	Resistor	6.2 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER932
R34	Resistor	3 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER158
R35	Resistor	7.5 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER719
R36	Resistor	30 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER672
R37	Potentiometer	10 kΩ, ±10%, 3/4 W, Met. Film	Beckman 77P	ER1723
R38	Resistor	43 kΩ, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER1002
R39	Resistor	20 Ω, ±5%, 1/2 W, Comp.	Allen Bradley Type EB	ER1003

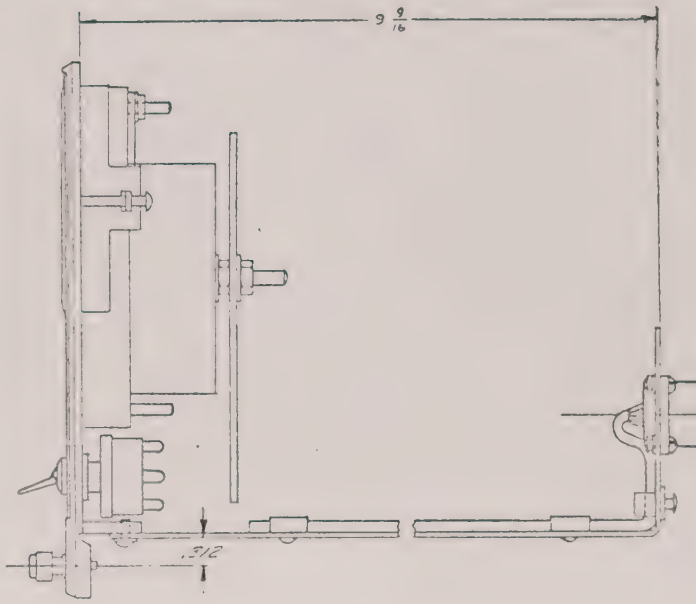
ELECTRICAL PARTS LIST (continued)

Des. No.	Part	Value and Description	Manufacturer and Part No.	Endevco Part No.
Q1	Transistor	2N3904	Motorola	EQ130
Q2	Transistor	2N3904	Motorola	EQ130
Q3	Transistor	2N388A	Texas Instruments	EQ81
Q4	Transistor	Matched Pair		16051
Q5	Transistor			
Q6	Transistor	2N388A	Texas Instruments	EQ81
Q7	Transistor	2N388A	Texas Instruments	EQ81
Q8	Transistor	2N388A	Texas Instruments	EQ81
Q9	Transistor	2N404A	Texas Instruments	EQ82
Q10	Transistor	2N3904	Motorola	EQ130
Q11	Transistor	2N3904	Motorola	EQ130
Q12	Transistor	2N404A	Texas Instruments	EQ82
Q13	Transistor	2N1381	Texas Instruments	EQ29
S1	Switch		Arrowhart 83054C	ES56
S2	Switch		Micro Switch 1PB13	ES68
V1	Tube		CK5886	EV20

LIST OF MATERIAL		
PART NO.	DESCRIPTION	QTY
2934A	PEAK HOLDING METER ASSY	1
15438	CABLE, INTERCONNECT	1

CHG	E.O.	DRAWING REVISIONS	BY	CHK	APPD
1	4425	RELEASED			



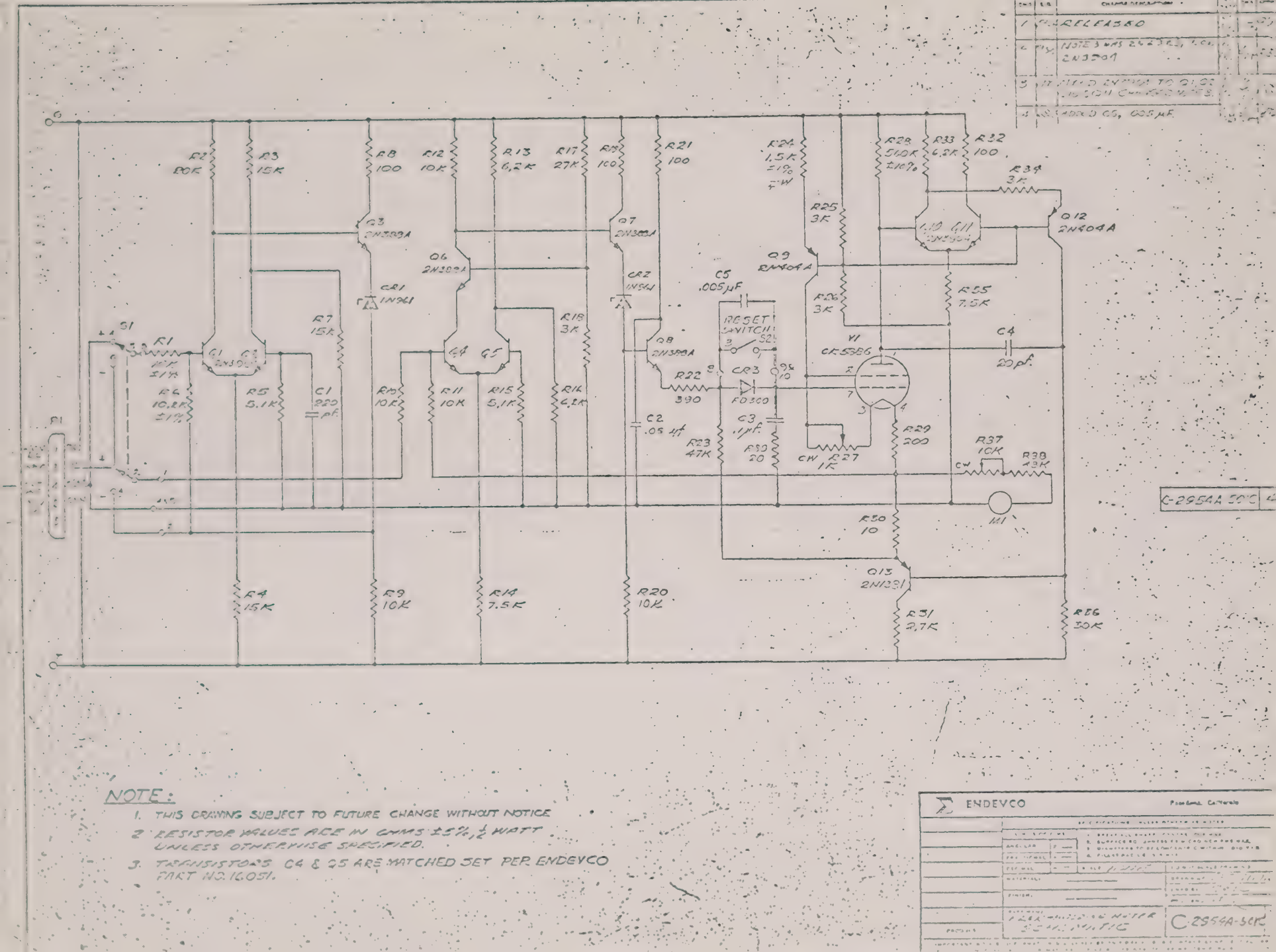


C-2934A-C | 1

NOTES:

1. THIS DRAWING IS SUBJECT TO FUTURE CHANGE WITHOUT NOTICE

ENDEVCO CORPORATION		
	PEAK HOLDING METER ASSEMBLY	C 2934A-C 1



NOTE:

1. THIS DRAWING SUBJECT TO FUTURE CHANGE WITHOUT NOTICE
2. RESISTOR VALUES ARE IN OHMS ±5%, ½ WATT UNLESS OTHERWISE SPECIFIED.
3. TRANSISTORS Q4 & Q5 ARE MATCHED SET PER ENDEVCO PART NO. 16051.

ENDEVCO

C-2954A-SCH

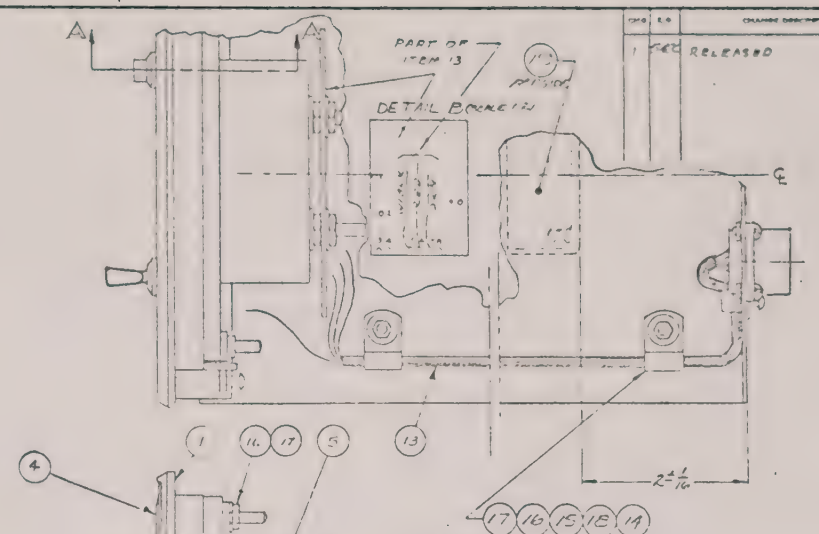
LIST OF MATERIAL

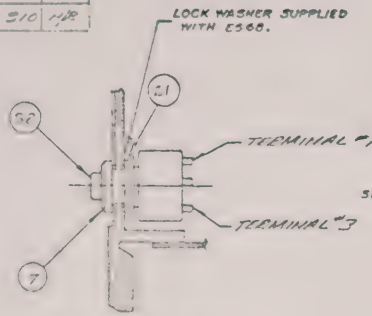
ITEM NO.	DESCRIPTION	QTY
1	FACE PLATE	1
2	POTENTIOMETER, TURN LOG	2
3	METAL CAL	1
4	PANEL, METAL	1
5	METER	1
6	CIRCUIT BOARD ASSY	1
7	PUSH TO TALK TOGGLE	1
8	SWITCH	1
9	KNOB PUSH	1
10	BASE	
11	SCREW 4-40 x 1/4	2
12	SCREW 4-40 x 5/16	6
13	LOCKWASHER #4	6
14	[illegible]	2
15	CABLE ASSY PUSH TO TALK ASSY	1
16	SCREW #6-32 x 5/16	2
17	LOCKWASHER #6	2
18	[illegible]	4
19	[illegible]	4
20	CLAMP, CABLE	2
21	MODEL-SERIAL PLATE	1
22	WIRE BUS AWG 22	.2'
23	WASHER FLAT .01 THK	1
24	NUT, HEX. 4-40	4
25	ADHESIVE, EASTMAN 910	1/2

ITEM	COLOR	FROM	TO
C	[illegible]	[illegible]	1-2
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	BLUE	[illegible]	S1-5
[illegible]	WHITE	ITEM 6-6	S1-4
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

GRN FRONT OF ITEM 13

S1 (VIEWED FROM WIRING SIDE)





SECTION A-A

NOTES:

1. ITEM 3 TO BE FIXED TO ITEM 1, USING ITEM 1 AS TEMPLATE CUT METER OPENING IN ITEM 3.
2. CEMENT ITEM 12 TO ITEM 8 USING ADHESIVE ITEM 22
3. MODEL SERIAL PLATE (ITEM 19) TO READ: "PEAK HOLDING METER ASSY" MODEL: '29544' SERIAL NUMBER TO BE SUPPLIED BY PRODUCTION.
4. THIS DRAWING IS SUBJECT TO FUTURE CHANGE WITHOUT NOTICE.

CHG NO.	CHANGE DESCRIPTION	DATE
1	RELEASED	

ENDEVCO CORPORATION

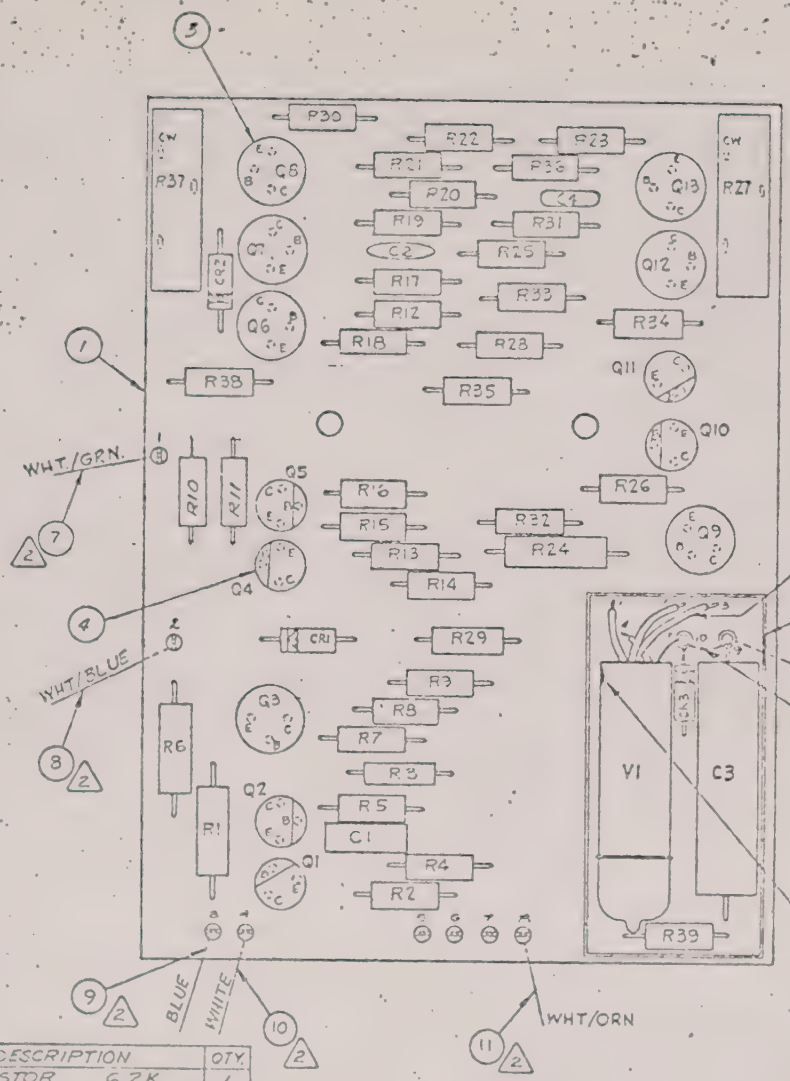
PEAK HOLDING METER MAIN ASSEMBLY

C 29544-1C

C-29544-1C 1

ITEM	PART NO.	DESCRIPTION	QTY.
1	10434	CIRCUIT BOARD	1
2	1277	SHIELD	1
3	[illegible]104	SPACER #10033	7
4	[illegible]103	SPACER #10034	6
5	[illegible]108	TUBING, TEFLON	A/R
6	[illegible]103	[illegible]	[illegible]
7	[illegible]102	[illegible]	[illegible]
C1	[illegible]	CAPACITOR 330pf	1
C2	[illegible]	CAPACITOR 1mf	1
C3	[illegible]	CAPACITOR 22pf	1
C4	[illegible]384	CAPACITOR .05 uf	1
C5	[illegible]	[illegible]	1
C6	[illegible]	[illegible]	1
C7	[illegible]	[illegible]	1
D1	[illegible]	TUBE	1
Q1	EQ151	TRANSISTOR 2N706A	4
Q2	EQ151	2N706A	-
Q3	EQ151	2N706A	1
Q4	EQ151	MATCHED PAIR	1
Q5	"	"	-
Q6	EQ151	2N706A	1
Q7	EQ151	2N706A	1
Q8	"	2N706A	-
Q9	"	2N706A	-
Q10	"	2N706A	-
Q11	EQ151	2N706A	-
Q12	"	2N706A	-
Q13	EQ151	TRANSISTOR 2N1351	1
R1	[illegible]	RESISTOR 6.2K	1
R2	EP139	30K	1
R3	EP139	15K	1
R4	EP139	15K	1
R5	EP153	5100Ω	1
R6	EP171	10.2K	1
R7	EP135	15K	1
R8	EP171	100Ω	1
R9	EP135	10K	1
R10	EP139	10K	1
R11	EP135	10K	1
R12	EP135	10K	1
R13	EP139	6.2K	1
R14	EP119	7500Ω	1
R15	EP153	5100Ω	1
R16	EP139	6.2K	1
R17	EP135	27K	1
R18	EP135	27K	1
R20	EP135	27K	1
R21	EP135	27K	1
R22	EP135	27K	1
R23	EP135	27K	1
R24	EP139	6.2K	1
R25	EP119	7500Ω	1
R26	EP153	5100Ω	1
R27	EP139	6.2K	1
R28	EP135	27K	1
R29	EP135	27K	1
R30	EP135	27K	1
R31	EP135	27K	1
R32	EP139	6.2K	1
R33	EP135	27K	1
R34	EP135	27K	1
R35	EP135	27K	1
R36	EP135	27K	1
R37	EP139	6.2K	1
R38	EP135	27K	1
R39	EP139	6.2K	1
VR1	EP1102	POTENTIOMETER 1K	1
VR2	EP1102	POTENTIOMETER 10K	1
VR3	EP1102	POTENTIOMETER 10K	1
W1	EW102	WIRE, WHITE/GREEN	4"
W2	EW102	WHITE/BLUE	2½"
W3	EW102	BLUE	2"
W4	EW102	WHITE	2½"
W5	EW102	WHITE/ORANGE	2½"
W6	EW102	WHITE/RED	3"

ITEM	QTY	DESCRIPTION
1	[illegible]	[illegible]
2	[illegible]	IN CKT C2 WAS EC103. C3 WAS C8 WAS ONE (EQ900)
3	2[illegible]	W3 & RED WERE EC[illegible]/GL[illegible]
4	[illegible]	ADDED [illegible] LEADS
5	[illegible]	ADDED ITEM 5
6	[illegible]	CORRECTED WIRE LENGTHS OF ITEMS 7 THRU 12.
7	[illegible]	ADDED ITEM 7 [illegible]
7A	[illegible]	ADDED [illegible] Q1, Q10, & Q11.
7B	[illegible]	[illegible]
8	[illegible]	C1, C2, C6, C5, C10, C11 WERE [illegible]
9	[illegible]	[illegible] WAS EW102 #37. WAS CHANGED. C4, C5 WAS EC153, 2N3904
9A	[illegible]	ADDED NOTE 1



DETAIL OF V1

7. WRAP ITEM 7 TWICE AROUND THIS END. ADD THIS HERE TO KEEP IT FROM SLIDING

C-12678C 9A

NOTES:

1. ALL RESISTORS EXCEPT R1, R6, R24, R27, & R37 TO BE BENT TO .562" ON MARK II MACHINE.
2. ATTACH WIRES THRU TERMINALS FROM CIRCUIT SIDE.

ENDEVCO

2054		CIRCUIT BOARD ASSEMBLY	C 12678C 9A
270-[illegible]			

LIST OF MATERIALS

ITEM	PART NO.	DESCRIPTION	QTY
1	EP299	PLUG #WK-5-23C-3/8	2
2	EHB 34	BUSHING, TELESCOPING	2
3	EW305	CABLE, 4 COND #22 AWG	9 1/2

B-15438CLA

CHG	E.O.	CHANGE DESCRIPTION	BY DATE	CHK	APPD
2	1011	REVISED & REDRAWN	[illegible]	KA	[illegible]
1	1261	DELETE VIEW A-A, ADDED TABLE A & KEYWAY	[illegible]	[illegible]	[illegible]

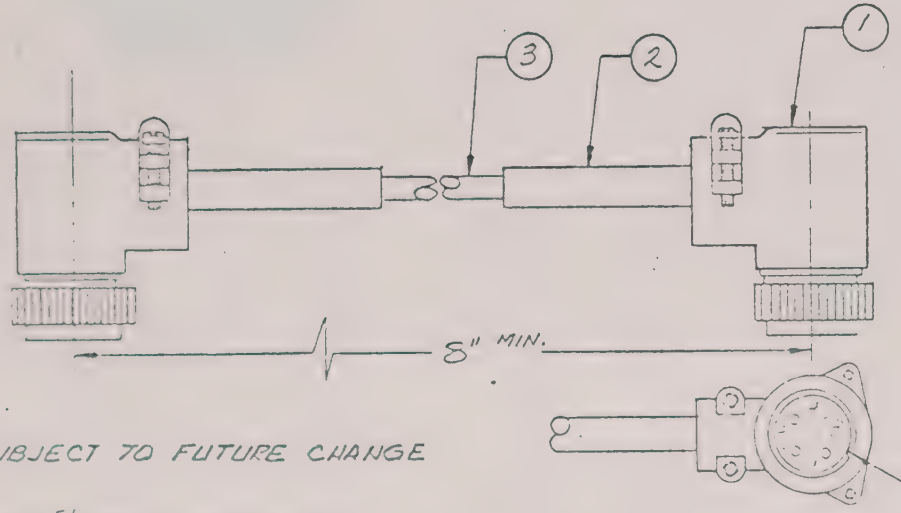


TABLE A (TYP)	
PIN	WIRE COLOR
1	RED
2	WHT
3	GRN
4	BLK
5	BLANK

NOTES:

1. THIS DRAWING SUBJECT TO FUTURE CHANGE WITHOUT NOTICE.
2. STRIP OUTER JACKET 5/8 LONG BOTH ENDS.
3. STRIP WIRE ENDS 1/4" & TIN.

ENDEVCO Pasadena, California
Division of Becton, Dickinson and Company

FSC 5411

DO NOT SCALE DRAWING

SPECIFICATIONS UNLESS OTHERWISE NOTED

LIMITS OF DIMS
ANGULAR ±
FRACTIONAL ±
DECIMAL ±

1. BREAK ALL SHARP EDGES .005 MAX
2. SURFACE ROUGHNESS 63 MICRO-INCH RMS MAX
3. DIAMETERS TO BE CONCENTRIC WITHIN .005 T I R
4. HOLE TOLERANCE PER ANSI B 50.1
5. ALL DIMENSIONS IN INCHES
6. FILLET RAD .5 MAX

MATERIAL: LISTED

DRAWN BY: [illegible]
CHKD BY: [illegible]
PROJ ENG: [illegible]

2718A
2354A
PRODUCT

PART NAME: CABLE, INTERCONNECT

SIZE B | DWG NO 15438EC | REV 2

IMPORTANT NOTICE: INFORMATION DISCLOSED BY THIS DRAWING IS ENDEVCO CONFIDENTIAL RE-PRODUCTION, DUPLICATION OR MANUFACTURE NO RIGHTS GRANTED BY WRITTEN PERMISSION ONLY

8 KV DIELECTRIC IMPOSE CLEARANCE 10KV-10

WARRANTY

Endevco Division of Becton, Dickinson and Company, warrants each new electronic instrument to be free from defects in material and workmanship for one year from date of shipment to the original purchaser. This warranty does not extend to units that have been misused or used in violation of Endevco recommendations, or to units that have been altered or repaired outside Endevco's factory. Defects covered by this warranty will be remedied at no charge, provided this instrument is delivered to the factory with all transportation charges prepaid. If, upon examination, it is found that the defect is not within the scope of this warranty, a statement of repair charges and a request for authorization to proceed with repair will be submitted.

The above warranty period does not extend to new cable assemblies, mounting accessories, connectors and other non-serialized products which are only warranted to meet applicable Endevco specifications when shipped from our factory.

The liability of Endevco under this warranty is limited to repair or replacement of any defective instrument within the sole discretion of Endevco. The foregoing warranty is exclusive and in lieu of all other warranties expressed or implied.

Aaron Barnett

Manager
Quality/Reliability Control

Vice President
General Manager

ENDEVCO
RANCHO VIEJO ROAD · SAN JUAN CAPISTRANO, CA 92675
A DIVISION OF BECTON, DICKINSON AND COMPANY

WARRANTY

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3 Frank L. Benedict, District Manager
ENDEVCO (Main Plant)*

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